

# Nuclear Division News

● Vol. 11, No. 26 ● December 25, 1980



Herman Fisher, right, representing Gov. Lamar Alexander's Committee for Employment of the Handicapped, presents one of three awards to Nuclear Division personnel. From left are Kathy Coleman, Lynda Lewis and Eric Plunkett, Affirmative Action coordinators for ORGDP, ORNL and the Y-12 Plant, respectively; Dale Wiley (seated in wheelchair), the Governor's liaison for the handicapped; Wayne McLaughlin, former Affirmative Action coordinator at ORGDP; Joanne Gailar, Nuclear Division Equal Opportunity coordinator; and Nuclear Division President Roger F. Hibbs, who accepted the committee's Distinguished Employer Award on behalf of the Division.

## Division cited by governor for handicap employment efforts

The Nuclear Division and its Equal Employment Opportunity personnel have received three awards from Gov. Lamar Alexander's Committee for Employment of the Handicapped.

The Division was given the committee's Distinguished Employer Award as the outstanding employer of the handicapped in this region. Distinguished Service Awards were presented to the Division's Equal Employment Opportunity staff and to B. Wayne McLaughlin, a former Affirmative Action coordinator at ORGDP.

The awards were presented by Herman Fisher, who has been Governor Alexander's representative on the committee, and Dale Wiley, the Governor's liaison for the handicapped. Nuclear Division President Roger F. Hibbs accepted the Distinguished Employer Award on behalf of the Division, and Joanne S. Gailar, Equal Opportunity coordinator, accepted her staff's award.

Also present for the presentation of the awards was Cal Gillespie, director of the Regional Division of Vocational Rehabilitation.

In making the award presentations, Fisher expressed the appreciation of Governor Alexander "for Union Carbide's cooperation in the employment of the handicapped on their own merits." Though the committee found the number of handicapped hired by the Nuclear Division

"terribly exciting," Fisher said, "we are less impressed by numbers than by the fact that your efforts have caused attitudinal and architectural barriers to begin to fall."

McLaughlin was cited for "exceptional contributions," particularly in volunteering his own time to speak to community representatives about employment opportunities for the handicapped.

The Nuclear Division has since 1978 had a strengthened commitment to the hiring of handicapped employees capable of performing particular jobs "with reasonable accommodation" to their handicaps. Forty-five handicapped persons were hired in 1979 and 35 in 1980.

During the past two years, the Division has made structural modifications to its facilities to accommodate wheelchairs, acquired two telephone/typewriters for use by totally deaf employees, and administered introductory and advanced sign language courses designed to help supervisors of deaf employees better communicate with their staffs.

Affirmative Action coordinators for the four Nuclear Division facilities are Kathy D. Coleman, ORGDP; Lynda Lewis, ORNL; Eric L. Plunkett, Y-12 Plant; and H. Frank Shanklin, PGDP. McLaughlin, now head of ORGDP's Employment Department, was Affirmative Action coordinator there from 1977 until 1979.

## Happy New Nanosecond!

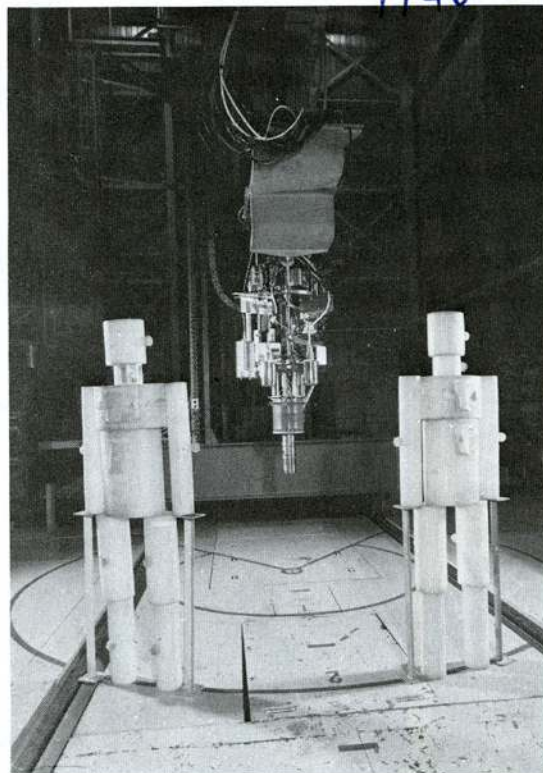
At midnight on New Year's Eve, when the bells toll, horns sound and the first strains of "Auld Lang Syne" are heard, one thing will be certain — 1980 will be past, and 1981 will be upon us.

Another certainty is the fact that not a single Nuclear Division employee will be exactly "on time" while kissing his or her mate or drinking a toast to the New Year. The precise moment of changeover from this year to the next actually will be recorded, not by the falling ball in New York's Times Square, but by a sophisticated atomic clock that splits seconds into billionths.

Precision timekeeping has progressed dramatically over the years. Observers no longer have to rely on the rotation of the earth or other fluctuating chronometers to record the passage of time. Division scientists, for example, routinely measure chemical reactions that last on the order of a nanosecond — a billionth of a second — or roughly the time it takes light to travel the thickness of eight pages of **Nuclear Division News**.

The primary standard for world timekeeping is based on a device known as a cesium atomic clock. The atomic second is defined as 9,192,630,770 oscillations of the atom cesium-133. So if your family or friends criticize you for going to sleep before midnight on New Year's Eve and missing the big moment, take comfort from the knowledge that they really missed it, too.

## In this issue . . .



A two-part feature on research reactors begins on pages 4 and 5, with an article on the historic Graphite Reactor, the High Flux Isotope Reactor, the Health Physics Research Reactor (left) and the Oak Ridge Research Reactor. Shown with the reactor at left are plastic phantoms used to simulate the human body in radiation experiments.

### Other features in this issue:

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## Savings Plan-Personal Investment Account

	Fixed Income Fund	UCC Stock	Equity Investment Fund
December 76	13.0553	59.2723	8.8166
December 77	14.2017	40.9096	8.0427
August 80	17.8746	46.0592	11.5199
September 80	18.0487	46.4911	11.7894
October 80	18.1805	46.5648	12.0227
November 80	18.3161	48.8017	13.2537

Note: Fixed Income Fund unit values reflect interest additions to achieve the guaranteed effective annual interest rate of 9.1% for 1980. Union Carbide stock values are the average cost of stock purchased during the month. Equity Investment Fund unit values represent the month-end market value of securities held by the Fund. The price of each unit is determined by dividing the total value of the securities by the number of units in the Fund.

## Hulett elevated at Paducah Plant



Hulett

Jack L. Hulett has been promoted to D shift superintendent at the Paducah Plant. He joined Union Carbide in 1951 as a machining supervisor. He was promoted to maintenance coordinator and later to general supervisor. Hulett attended Paducah Community College and was employed at the Illinois Gulf Central Gulf Railroad before coming to the Paducah Plant.

He and his wife, Charlene, have three daughters, Mrs. Dennis Steger, Mrs. Ronald Watson and Janie Hulett. A native of Clinton, Ill., Hulett lives on Springdale Circle, Paducah.

## Recent Retirements

(Editor's Note: A host of Nuclear Division employees will be retiring December 31. They will be apportioned out in the next few issues of the News.)



**Audra L. Southern**  
Separation Systems  
ORGDP  
33 years service



**Louis L. Fairchild**  
Chemical Technology  
ORNL  
36 years service



**James H. Burkhardt**  
Instrumentation and  
Controls  
ORNL  
29 years service



**Glenn I. Davis**  
Guard Department  
Y-12  
33 years service



**Hugh E. Robertson**  
Engineering Technology  
ORNL  
30 years service



**William R. Whitson**  
Chemical Technology  
ORNL  
29 years service



**Katherine G. Baker**  
Technical Services  
ORGDP  
28 years service



**Henry E. Penland**  
Engineering Technology  
ORNL  
37 years service



**Wayne C. Lyon**  
Maintenance  
ORGDP  
19 years service



**James F. Price**  
Guard Department  
Y-12  
30 years service



**James F. Morehead**  
Medical Department  
Y-12  
34 years service



**John A. Montgomery**  
A Wing Shop  
Y-12  
11 years service



**Clyde E. McFarland**  
Operations  
ORNL  
33 years service



**George A. May**  
Plant Protection  
Y-12  
37 years service



**Dramia M. Smith**  
Instrumentation and  
Controls  
ORNL  
23 years service



**Frank J. Parris**  
Maintenance  
ORGDP  
35 years service



**Stephen J. Ditto Jr.**  
Instrumentation and  
Controls  
ORNL  
25 years service



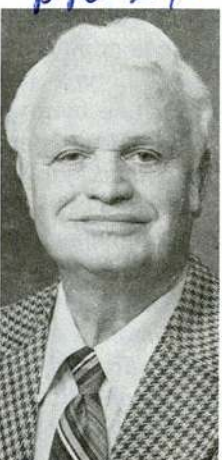
**Dillard D. Spangler**  
Maintenance  
Y-12  
35 years service



**Joe F. Harvey**  
General Accounting  
ORGDP  
35 years service



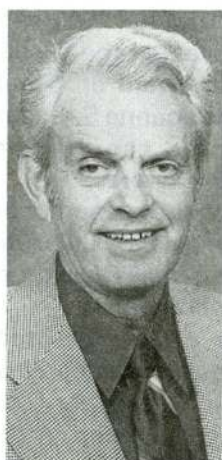
**Alvie H. Gough**  
Utilities  
Y-12  
36 years service



**Murrell R. Whaley**  
Research Services  
Y-12  
25 years service



**John P. Miser**  
Plant and Equipment  
ORNL  
30 years service



**Homer T. Crawford**  
Materials Forming  
Y-12  
29 years service



**Claude T. Miracle**  
Operations  
ORGDP  
35 years service



## Question Box

### How many recent new hires in Y-12 were Vietnam veterans?

**QUESTION:** How many laborers, janitors, etc., were hired in the Y-12 Plant during October 1980? How many of these were Vietnam-era veterans?

**ANSWER:** A total of six laborers, five cleaners, nine general helpers, and 28 building services employees were added to the Y-12 payroll during the month of October 1980. In this group of 48 employees, 23 were new hires while the remaining 25 employees were added to the payroll via interplant transfers. There were

seven Vietnam-era veterans in this group; two were new employees.

#### Orthodontics for adults

**QUESTION:** More and more adults are requiring orthodontic work. Are any plans being made to have our dental insurance cover employees as well as dependents under 19?

**ANSWER:** Sorry, but there are no plans to extend the coverage. Many dental insurance policies don't cover orthodontic work at all since it is largely an elective procedure that falls

outside the true insurance concept of random risk. Effective November 1, the lifetime allowance for orthodontic work on children was increased from \$500 to \$750, but the coverage remains limited to children under age 19.

#### Child care expenses

**QUESTION:** Why are child care expenses that are incurred as a direct result of business-related travel not considered by the Company to be reimbursable?

**ANSWER:** There are some limited provisions for reimbursement of expenses related to dependent children. For those who qualify, inbound hired or transferred employees' dependents are covered for per diem expenses, the amount depending on their ages. However, in connection with routine business travel, if an employee elects to take his/her spouse or if an employee is a single parent, child care expenses for baby-sitting are not reimbursable.

### Engineering names Weathersby to new post

The appointment of William E. Weathersby as manager of General Engineering for the Nuclear Division has been announced by Finis S. Patton, Director of Engineering. Weathersby will be responsible for civil/structural engineering, engineering mechanics and environmental control engineering. He succeeds Hugh C. Beeson, who was recently named manager of the Maintenance Division in Y-12.

A native of Marshall, Tex., Weathersby was graduated from Texas A&M University where he received his bachelor's degree in mechanical engineering. In addition, he has taken some graduate work at the University of Tennessee.

He joined Union Carbide in Oak Ridge in 1956. He worked at the Oak Ridge Y-12 Plant in engineering mechanics and project engineering, following which he was associated with Union Carbide's Mining and Metals Division in Uravan, Colo., for about two years. Since his return he has been involved in tool design, engineering mechanics, and civil and architectural engineering. Most recently, he has been deputy manager of gas centrifuge engineering at the Oak Ridge Gaseous Diffusion Plant.

A registered professional engineer, he is a member of the National Society of Professional Engineers.



Weathersby

Weathersby and his wife, the former Betty Covert, live at 117 Mason Lane, Oak Ridge. They have two daughters.

### Save Energy / Share The Ride

#### Y-12

RIDERS for VAN POOL from LaFollette/Clinton area to all portals, 8-4:30. Jerry Owens, plant phone 4-1046, home phone LaFollette 562-6830.

RIDERS for VAN POOL from Maryville to East and North Portals, straight day. Darell Coppenger, plant phone 4-1380, home phone Maryville 983-5939.

RIDE from Briar Road, one block off Turnpike, in West Oak Ridge to North Portal, 4:30 p.m.-12:30 a.m. Jerry Lewis, home phone Oak Ridge 483-9689.

ONE or TWO CAR POOL MEMBERS from Norwood, Knoxville, to any portal, 8-4:30 shift. Sam Benton, plant phone 4-1893, home phone Knoxville 687-9496.

#### ORNL

VAN POOL RIDERS from West Knoxville, Walker Springs/Cedar Springs Shopping Center area to Lovell Road, to West and South Portals, 8 to 4:30. Mike Caldwell, plant phone 4-4885; home phone Knoxville 691-4194.

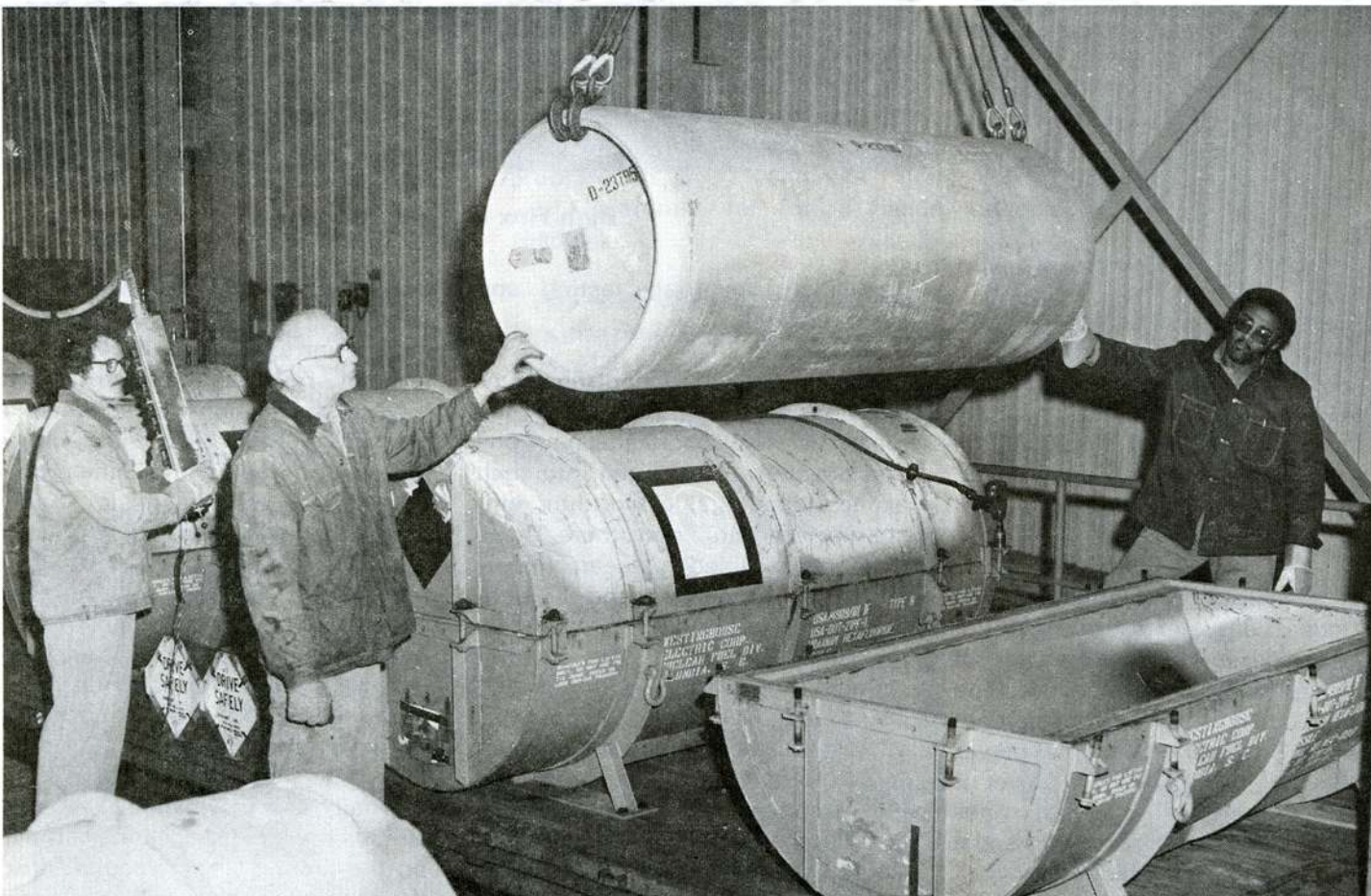
ONE or TWO CARPOOL MEMBERS from within or near the area bounded by Pennsylvania, West Outer, Highland and Hillside Avenues to East Portal, 8:15-4:45. T. J. Burnett, plant phone 4-6683; or Pat Roberts, plant phone 4-6744.

RIDE from Lawnville Meadows, Kingston, to East Portal, 8-4:30. Joy H. Wright, plant phone 4-4170; home phone 376-7612.

VAN POOL RIDER from West Knoxville (Bearden to Farragut) to South and West Portals, 8-4:30. Dean Treadway, plant phone 4-6580; home phone 584-4879.

RIDE NEEDED from West Knoxville (Walker Springs area near Gallaher View Road) to any portal. Thelma Limehouse, plant phone 6-7429.

RIDE NEEDED from Oak Ridge Highway between Karns and Solway to East Portal, 8:15-4:45. Peterson, plant phone 4-4483; home phone 690-3989.



On Monday, December 15, nearly 12 years since the Toll Enrichment Program began at ORGDP, employees shipped the 10,000th cylinder of enriched uranium hexafluoride. The Toll Enrichment Program, under which privately licensed owners — both foreign and domestic — bring their uranium for enriching on a "toll" or fee basis, was formally launched on January 1, 1969, and the first cylinder was shipped to Euratom on January 6 of that year. Each cylinder contains approximately 5,000 pounds of enriched uranium hexafluoride. Cylinder Number 10,000 went to Westinghouse Electric Corporation for use in the Millstone Nuclear Power Station, Unit 2, in Connecticut. Measured in "separative work dollars" — a measure of the cost of enriching the uranium to make it suitable for use as reactor fuel — the value of the total uranium in the 10,000 cylinders shipped over the years is in excess of \$3.25 billion. All 10,000 reached their destinations safely. Pictured above at the Toll Enrichment Facility are ORGDP employees (from left) Wayne McGhee, Gene Ault and Clarence Pate.



# Nuclear research reactors — at the 'core' of C

At precisely 5:01 a.m. November 4, while most employees were at home sound asleep, an important anniversary slipped by without notice. At that very moment, 37 years ago, a small group of scientists under the supervision of Enrico Fermi assembled enough uranium fuel in a graphite block to start a chain reaction and begin operation of the "X-10" Graphite Reactor.

\* \* \*

The impetus for that event was another historic moment that occurred about a year earlier, on December 2, 1942, when Fermi and colleagues at the University of Chicago demonstrated that a nuclear chain reaction could be self-sustaining and controlled and that nuclear fission — the splitting of uranium atoms by neutrons — offered exciting possibilities as a new source of almost unbelievable power.

Clinton Laboratories (now Oak Ridge National Laboratory), the Y-12 Plant and the Oak Ridge Gaseous Diffusion Plant were all established as a direct result of that discovery.

A key aspect of the super-secret wartime enterprise in Oak Ridge was the construction of the Graphite Reactor, the first in a long line of scientific instruments spearheading ORNL's role as world leader in the utilization of nuclear research reactors. These reactors, described below, offer unique capabilities for basic, applied and developmental research at the frontiers of our understanding of matter and energy.

## Graphite Reactor

Today, the Graphite Reactor, the first nuclear reactor to operate at power, is a National Historic Landmark visited annually by thousands of persons. By conventional standards, the reactor was a primitive machine indeed. In its heyday, however, the Graphite Reactor was the most sophisticated scientific instrument of its type ever built.

The initial task of the reactor was to produce the first gram quantities of the man made element plutonium, as part of the Manhattan Project to win the war. Later, the reactor became the pioneering instrument for nuclear research studies as well as the world's leading producer of radioisotopes for medical, agricultural and industrial applications.

Basically, the Graphite Reactor was a 24-foot graphite cube encased in a shell of concrete 47 feet long, 38 feet wide and 32 feet high. When a sufficient amount of fuel, natural uranium-238 encased in gas-tight aluminum jackets, was loaded manually into the reactor, a nuclear chain reaction began spontaneously as the

safety rods and finally the control rods were withdrawn.

The safety and control systems of this 4.0-megawatt, air-cooled reactor consisted of seven steel and boron or cadmium rods, which acted as neutron absorbers and ensured instantaneous shutdown and adequate control at desired power levels.

Research facilities at the Graphite Reactor could accommodate more than 36 experiments and expose 1,000 samples or target materials to irradiation simultaneously for radioisotope production. In addition, tunnels in the graphite were available to researchers for irradiation of biological specimens. These tunnels also were used for irradiating soy beans, popcorn and peanut seeds for mutation studies.

After 20 years of operation — from 1943 to 1963 — the Graphite Reactor was shut down, leaving behind an unprecedented record of scientific achievement and laying the groundwork for even greater achievements in the peaceful uses of nuclear energy.

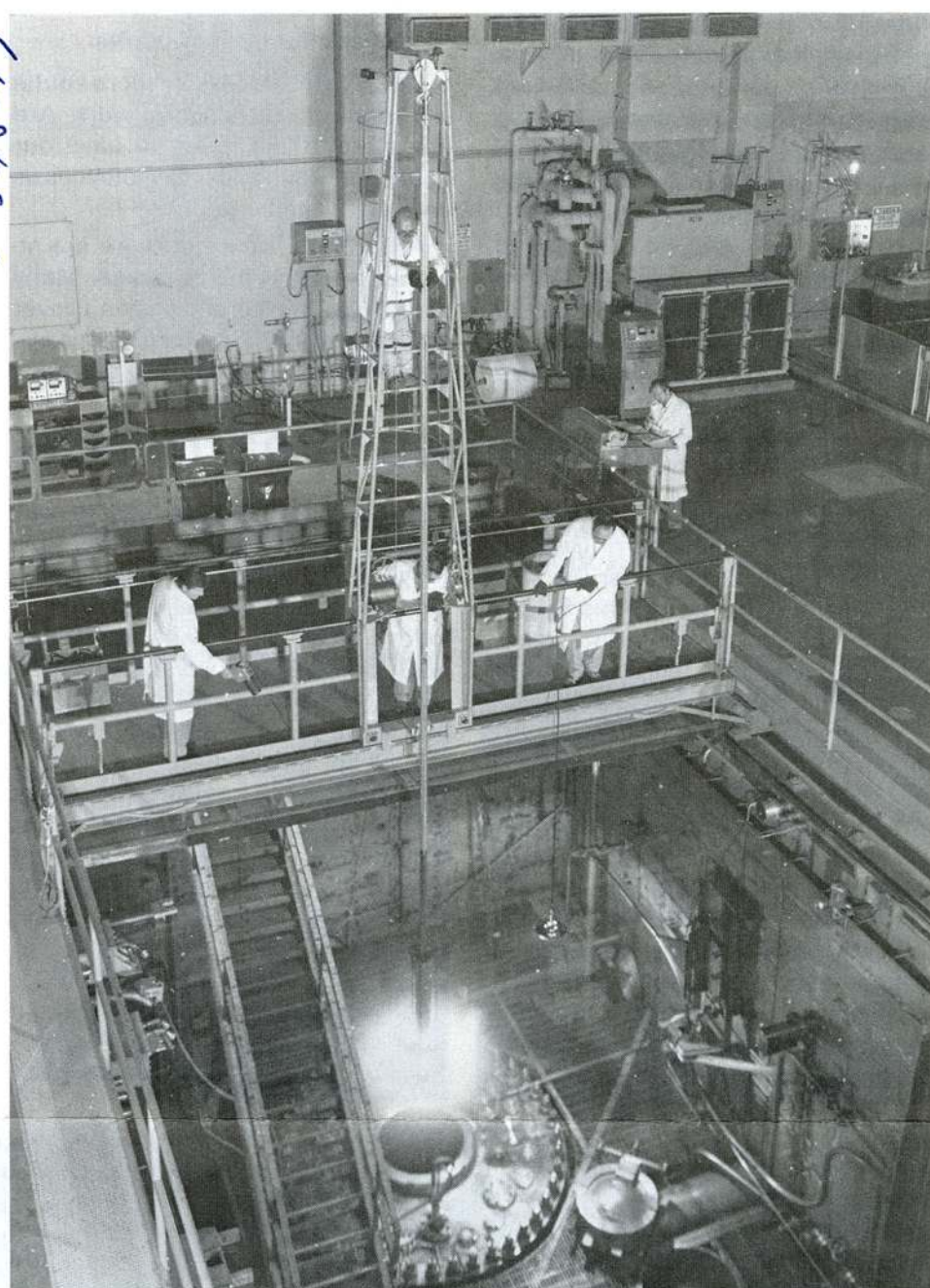
## High Flux Isotope Reactor

The High Flux Isotope Reactor (HFIR), completed in 1965, is the world's most powerful research reactor and a prime facility in the national program to produce and conduct research on man made chemical elements heavier than plutonium.

The reactor is fueled by about 20 pounds of 93 percent uranium-235. This compares to about three tons of this fissionable uranium isotope enriched to only two or three percent used in a typical commercial power reactor. HFIR operates at a power of 100 megawatts — about one-thirtieth the power of commercial electric-generating plants.

The unique characteristic of HFIR, a light-water-cooled, pool-type reactor, is the high flux of neutrons — approximately 5 million billion ( $5 \times 10^{15}$ ) per square centimeter per second — produced by its highly enriched uranium fuel.

Neutrons are the key to the reactor's three principal applications — heavy element and isotope



## High Flux Isotope Reactor

production, materials testing and basic research.

In the reactor core, neutrons bombard inserted target rods containing materials that absorb the neutrons and are then transmuted into such exotic elements as californium, einsteinium, fermium and others. These elements are used in research laboratories in this country and throughout the world.

Californium-252 is HFIR's principal product. A versatile isotope, it has a low heat output, a half-life of about three years and can be fabricated into small-sized sources. It emits copious amounts of neutrons, making it essentially a portable "mini-reactor" which can be used in remote environments as well as in research laboratories and industrial plants. Aside from pure scientific research, californium-252 sources have been used in medical diagnosis and treatment, mineral and oil exploration, pollution analysis and industrial product quality control.

In addition to heavier-than-plutonium elements, HFIR produces

dozens of other isotopes that are shipped to more than a hundred foreign countries for use in a wide variety of research, industrial and medical applications. For example, a number of HFIR-produced isotopes are used in nuclear medicine procedures for the early diagnosis of heart, lung and kidney disease.

In support of nuclear energy development, HFIR also is used for irradiation testing of candidate fuels and materials under conditions much more severe than normal operating environments.

Finally, as a tool for basic research, HFIR is the site for advanced studies on the atomic and molecular structures of materials. Intense neutron beams extracted from the reactor's core are focused onto specimens monitored by sophisticated instruments including "electronic cameras." The interaction of the neutron particles with the specimens result in neutron diffraction patterns of "pictures" from which structural information that is not available from X-rays or other techniques can be obtained.



# ak Ridge history

## Health Physics Research Reactor

The Health Physics Research Reactor (HPRR), constructed in 1962, is a small, unshielded fast reactor, fueled with an enriched uranium-molybdenum alloy. It is used for biological research, dosimetry development and intercomparison and training.

In general, biological researchers expose plants and animals to known doses of radiation from HPRR and study the resulting effects. The HPRR staff has assisted researchers from ORNL's Health and Safety Research and Biology Divisions, the Civil Aero-medical Institute, the Comparative Animal Research Laboratory and various university medical centers in designing and performing experiments.

A number of projects in design and dosimeter development are carried out at HPRR. Some research involves blood sodium studies using plastic phantoms to simulate the human body (see photograph). Other work has been performed by the Tennessee Valley Authority (TVA), Westinghouse and Goodyear Atomic Corporation (GAC). The work with GAC is ongoing and involves the design, development and testing of a criticality alarm system for the new gas centrifuge plant near Portsmouth, Ohio.

The HPRR is used annually for two intercomparison studies — the Nuclear Accident Dosimetry (NAD) Study and the Personnel Dosimetry Intercomparison Study (PDIS). Over the past 17 years, participants from 54 different organizations (16 foreign) have participated in the NAD study, in which they test NAD systems under simulated nuclear accident conditions and compare their results with other participants who

made measurements under similar conditions. In the PDIS study, personnel dosimeters mailed in by participants are irradiated and returned for evaluation.

Training at HPRR has involved student groups from five universities and power reactor operators-in-training from TVA performing a variety of nuclear-engineering-type experiments. The trainees also become acquainted with reactor safety instrumentation and procedures and receive practical instruction involving radiation dosimetry.

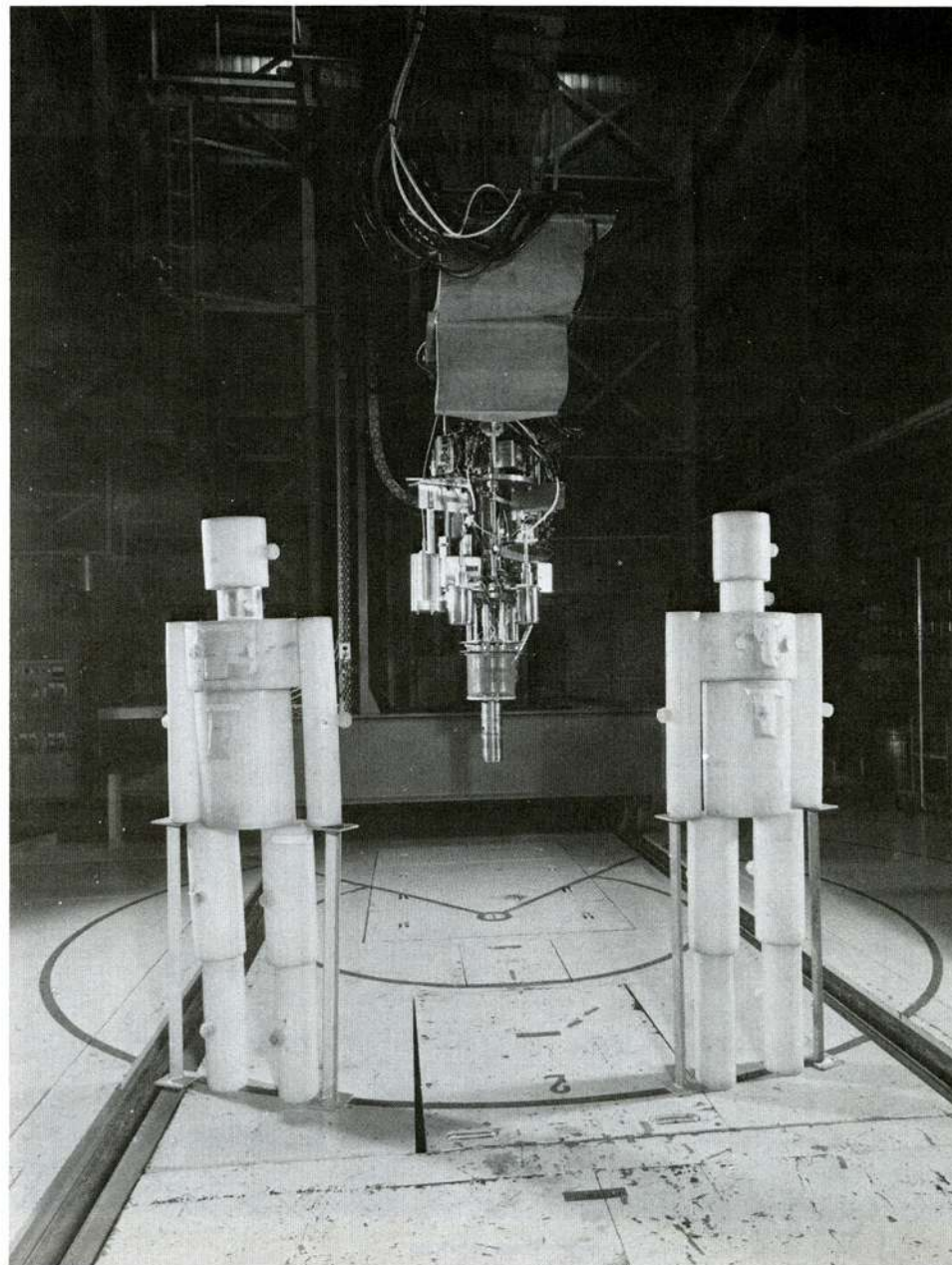
## Oak Ridge Research Reactor

The Oak Ridge Research Reactor (ORR), first operated in 1958, is a 30-megawatt light-water-cooled and -moderated reactor used for radioisotope production, neutron diffraction studies and materials damage research.

The reactor core is located in the base of a large aluminum tank within a pool of demineralized water 21 feet long, 10 feet wide and about 30 feet deep. Two adjoining pools are of the same size. The three pools have a combined capacity of approximately 120,000 gallons of water.

The ORR is involved in safety-related studies for advanced reactor systems such as the Liquid Metal Fast Breeder Reactor (LMFBR) and also serves as an irradiation testing facility for the national fusion energy program, to study candidate "first wall" materials for future fusion reactors.

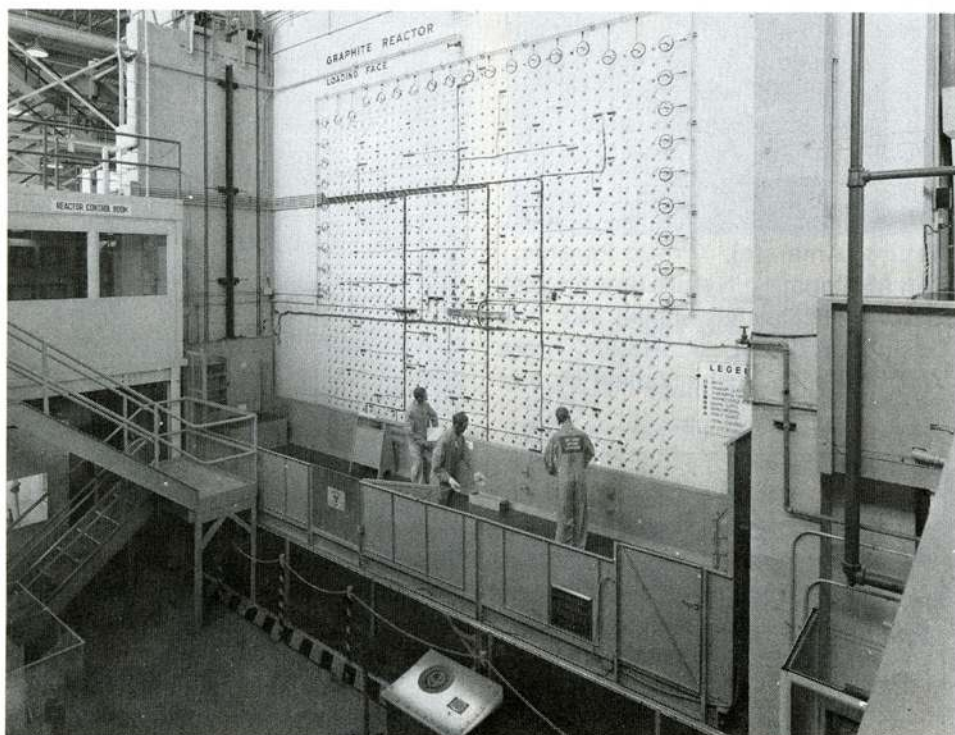
*(Three other ORNL research reactors, the Bulk Shielding Reactor, Pool Critical Assembly and Tower Shielding Reactor, will be featured in the January 15 issue of Nuclear Division News.)*



Health Physics Research Reactor



Oak Ridge Research Reactor



Graphite Reactor



## Holiday jam cake recipe 'jammed-up' in last issue

(Editors's Note: Before you try the jam cake recipe in the last issue, you'd better check the ingredients...we left off the flour.)

### Blackberry jam cake

1 cup brown sugar  
2 sticks margarine or butter  
4 eggs (blend together)

Add 1 cup thick blackberry jam and 1 cup chopped pecans or walnuts.

1 teaspoon allspice  
1 teaspoon cinnamon  
½ teaspoon ginger  
1 tablespoon cocoa  
1 teaspoon soda  
1 teaspoon baking powder  
2 cups plain flour

Mix together adding gradually 1 cup buttermilk. Bake at 350° for 30 minutes in greased floured pans. Cool before icing.

### Icing

Blend 1 cup condensed cream, 3 cups sugar, 2 sticks margarine and 2 tablespoon white syrup. Cook together until it reaches softball stage (about 20 minutes at medium heat). Add 1 can coconut, 1 small can drained crushed pineapple, 2 cups raisins and 1 cup chopped nuts. Apply to sides and top.

Good after it has "aged" too!

UNION  
CARBIDE

## Nuclear Division News

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INTERNATIONAL ASSOCIATION OF BUSINESS COMMUNICATORS



"Footprint," by John Blankenship

## Division Deaths



Mr. Williamson

Robert D. Williamson, a machinist in the ORNL Plant and Equipment Division, died November 29 at a Knoxville hospital. He was a 22-year Carbide employee.

Mr. Williamson, who lived at 2504 Corydon Drive, Knoxville, was a member of West View United Methodist Church and the Junior Order of UAM, No. 293. He was a veteran of the Korean War.

Survivors include his wife, Barbara; sons, Bob, Dan and Doug; daughters, Susan and Donna; and sister, Mrs. Virginia Clarkson, all of Knoxville.

Graveside services here held at New Gray Cemetery.



Mr. Huber

Frank Huber Jr., a 29-year ORNL employee, died December 12 at a Knoxville hospital. He was a science technician in the Operations Division.

Mr. Huber, who lived at 6713 Atkinson Lane, Knoxville, was a member of the National Society of Senior Engineering Technicians. He was also founder and governing officer of the East Tennessee School of Preaching and Missions.

Survivors include his wife, Irene B.; son, Frank III, Athens, Ala.; and daughters, Carolyn York, Knoxville; Polly Huber, Little Rock, Ark.; and Rebecca Jansen, Bury St. Edmonds, Great Britain.

Funeral services were held at Weaver Funeral Home, Knoxville. Memorials may be made to the East Tennessee School of Preaching and Missions Scholarship Fund, 6608 Beaver Ridge Road, Knoxville 37921.

## Camera Club Salon now open

The Carbide Camera Club Annual Salon is being held through January 17 at the Oak Ridge Art Center, 201 Badger Road. The photographic exhibition is open to the public at no charge.

Exhibition winners have been announced in the following categories: Color Prints - Pictorial and Best of Show, "Shadows and Light, #1, Marion Fox; Nature (Animate), "Tide Flat," Peggy Turner; Nature (Inanimate), "Flowers," Marion Fox; Art and Design, "Mirrored Escalator," Hal Smith; and Open, "Luxury," Carolyn Angel.

Black and White Prints - Pictorial, "Jefferson County"; Art and Design, "Footprint"; Open and Best of Show, "Leaf," all by John Blankenship.

Slides - Portraits, "Ann by Natural Light," John Johnson; Pictorial, "Seagulls on the Beach," Hal Smith; Nature (Animate), "Proud Parents," Ron McConathy; Nature (Inanimate), "Hydra," Ralph Donnelly; Art and Design and Best of Show, "There Will Be Peace in the Valley, by and

by," Bill Clark; and Open, "Strangers," Joel Buchanan.

Awards of Photographic Excellence went to Art Snell (Prints) and Bill Clark (Slides).

The work of these and many other Carbide photographers will be on display during the Salon.

## Barbara Honeycutt named statistician



Honeycutt

Barbara M. Honeycutt has been named a statistician in Technical Services at ORGDP. A native of Hariman, she worked as a summer employee while attending Tennessee Technology University, and holds a BS degree from the University of Tennessee.

She joined Union Carbide in 1969. She and her husband, Wayne, live in Smokerise Subdivision, Rockwood. They have a son, Michael.

## Next issue...

The next issue will be dated  
January 15. The deadline is Jan-  
uary 7.



# Dedication ceremony held at ORNL Holifield Facility

The Holifield Heavy Ion Research Facility (HHIRF), whose towering concrete structure dominates the ORNL skyline, was dedicated December 8 in ceremonies at which former Representative Chet Holifield of California, long-term member and chairman of the Congressional Joint Committee on Atomic Energy, was the honored guest.

Among the 60 side guests were 10 members of the Holifield family: the director of DOE's Office of Energy Research, Edward A. Frieman, who gave the dedicatory address; Jack E. Reese, chancellor of the University of Tennessee Knoxville; Wendell G. Holladay, provost of Vanderbilt University; and Phyllis Severance, representing Governor Lamar Alexander.

ORNL Director Herman Postma unveiled an oil portrait of Holifield which will be placed in the HHIRF complex. "In many ways," he said, "this facility owes its existence to Chet Holifield. It received its primary consideration while he served on the Joint Committee. And it was his own vision of the needs and necessity for balance in basic research that helped to establish the national laboratories, that established the foundation of nuclear energy and nuclear research in this country...Chet Holifield caused the highest caliber of people to be attracted to government service and to the laboratories. He inspired, by his own example and persuasion, the best in everyone."

Responding, Holifield said, "I con-

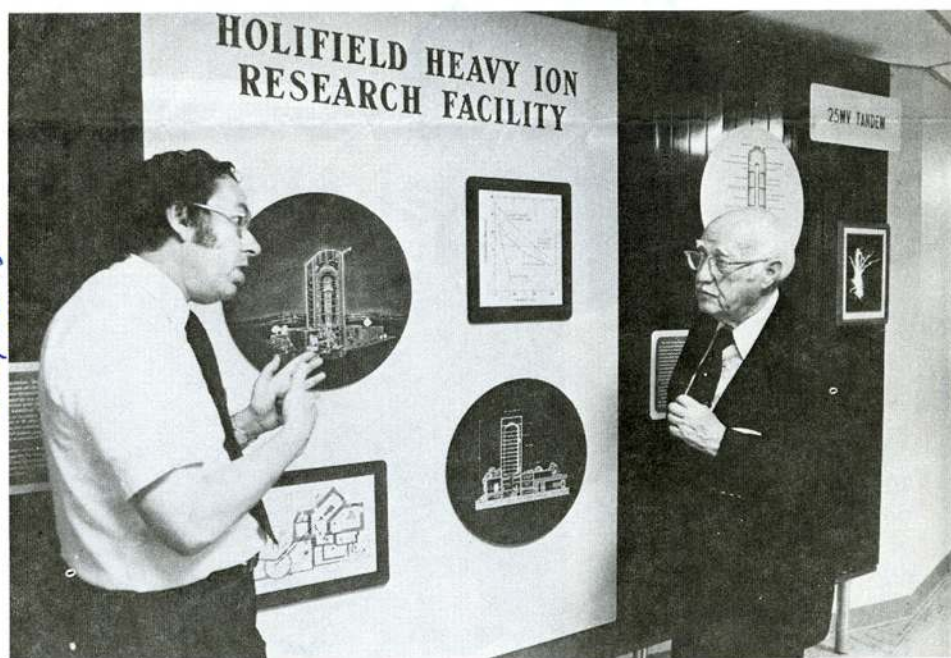
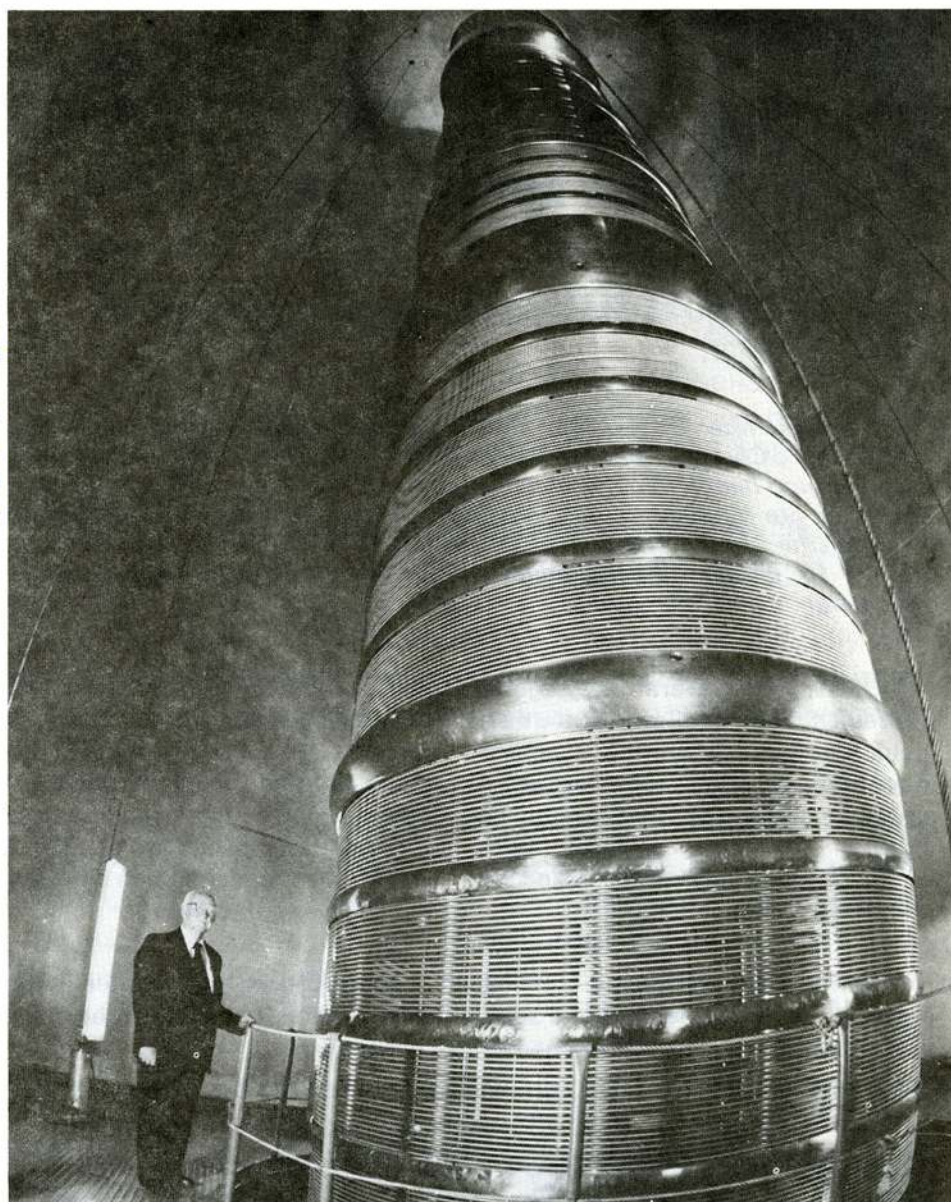
sider the tribute, and remarks made today on my behalf, the highest honor I have received in my 32 years of public service. I accept the honor with deep humility, as a recognition of the service of all the members of the Joint Committee on Atomic Energy.

"We must remember that Congress possessed no members with scientific degrees in physics, chemistry or engineering in 1946. It was necessary to select and appoint members to the new Joint Committee who were nonscientific laymen — and the members became students. Together we moved forward into the strange and mysterious world of pure scientific research and engineering applications of the properties within the atom.

"That was the real beginning of Congressional education of the importance of pure scientific research. I believe the Heavy Ion Facility to be one more curiosity of the scientifically oriented human mind."

ORNL Associate Director Alex Zucker, who served as director of the National Heavy Ion Laboratory Project that culminated in HHIRF, presided at the ceremonies and distributed medallions depicting the facility to those who had made significant contributions to its development.

Holifield and his wife, Cam, were joined for the dedication by three of their daughters, Lois Mulholland, JoAnn Ward and Betty Feldmann.







## Medicine Chest

# New treatment for heart disease?

by T. A. Lincoln, M.D.

(Editor's Note: Dr. Lincoln alternates his regular column with "The Medicine Chest," where he answers questions from employees concerning health in general. Questions are handled in strict confidence, as they are handled in our Question Box. Just address your question to "Medicine Chest," NUCLEAR DIVISION NEWS, Building 9704-2, Stop 21, Y-12, or call the news editor in your plant, and give him or her your question on the telephone.)

**QUESTION:** "Several days ago, a retired UCC-ND employee suffered a mild heart attack. During a subsequent conversation, he mentioned a possible treatment that might be helpful to heart patients with occluded blood vessels and asked me to present his idea to you.

tion called Polyox that is used in fire hoses to make more water get through. He theorized that if Polyox could be made compatible with the blood stream, more blood could get through partially blocked arteries. Do you know of any research being conducted along this line?"

"He had been interested in fire fighting, and he remembered a solu-

**ANSWER:** Polyox Water-Soluble Resins are poly (ethylene oxide)

homopolymers made by Union Carbide. They are straight-chain polymers with molecular weights ranging from 100,000 to about 5 million. These are huge molecules that have many interesting properties.

Polyox Resins are completely soluble in water as well as in many common organic solvents. They have low toxicity; high thickening efficiency; outstanding friction reduction properties; high resistance to biological attack; excellent flocculating properties; a soft, silky feel in solutions and an ability to form complexes with a broad spectrum of materials. They are supplied as white granular powders.

## Used in cosmetics

These resins are used in the aviation industry for thickening and stabilizing de-icing fluids because of their complete water solubility and thickening efficiency. They thicken and control flow of asphalt-, cement- and gypsum-based products. Because of their water solubility and soft, silky feel, they are used in many cosmetic products like creams, lotions and shampoos. For the same reasons, they are used in dental adhesives, tablet binders and coating and toothpastes. They are also used as plasticizers for polyvinyl resins and for glue and gelatin.

There are hundreds of uses for these resins, but the one of greatest interest to us is for drag reduction of fluids moving through pipes and hoses. The concentration of the polymer required is low — from only 1 to 500 parts per million by weight. The drag for turbulent flow can be greatly reduced.

## Emergency use

In emergencies like fire fighting,

the value of these benefits is far greater than the costs. By injecting these resins in storm sewers, for example, the flow rate during a sudden storm can be increased two- to fourfold. When drag-reducing polymers are injected into the boundary layer of a ship, the speed of the vessel can be increased by up to 30 percent. Thus, the polymers could be used with hydrofoils when the foil is raising the ship out of the water.

I have been unable to find published reports of experiments in human medicine. Polyox resins have been studied in the laboratory as the driving fluid of artificial hearts. Apparently, some investigators have considered introducing polymers directly into the blood of animals with heart disease or arteriosclerosis. It has been shown that Polyox Resins reduce the hemodynamic drag of blood in tubes in the laboratory, and that it is not toxic to rats.

## Effect on kidneys

Unfortunately, I have been unable to locate the right person to talk with to find out whether any medical research is going on at this time. These materials obviously would have to have a reasonably long residence time in the blood stream to be useful. If the polymer is broken up as it passes through the metabolic "furnace" of the liver, it wouldn't be particularly useful except possibly during the acute phases of a heart attack. Another question would be related to the effect on the kidneys. Would these large molecules plug up the filters?

I am sorry that I cannot give a yes or no answer at this time. I will continue to try to find out if someone is studying the possible uses of these fascinating compounds in medicine.



**FLIPPING ITS LID**—An old out-of-use water tower at the Paducah Plant lost its top recently. Workmen completely cut the tank's circumference, then lifted the top of the tower from its base. The rest of the 60-foot structure was disassembled in two sections. The water tower was used from the early '40's, while a part of the Kentucky Ordnance Works, until about 1975.

# Safety Scoreboard

Time worked without a lost-time accident through December 18:

Y-12 Plant .....	87 Days	2,873,000 Employee-Hours
ORGDP .....	90 Days	2,689,637 Employee-Hours
ORNL .....	221 Days	5,211,831 Employee-Hours
Paducah .....	142 Days	1,315,000 Employee-Hours

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